



NATIONAL RADIO ASTRONOMY OBSERVATORY

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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
A National Broadband Plan for Our Future) GN Docket 09-51

Comments of the
National Radio Astronomy Observatory
Charlottesville, VA 22903

I. Introduction

1. The National Radio Astronomy Observatory (NRAO) is pleased to provide comments responding to the Commission's Notice of Inquiry concerning "A National Broadband Plan for Our Future".
2. NRAO (<http://www.nrao.edu>), operated by Associated Universities, Inc., (<http://www.aui.edu>) under a cooperative agreement with the National Science Foundation, is the largest radio astronomy observatory and one of the largest astronomical observatories in the world. It operates within the National Radio Quiet Zone and in one dozen rural locations within the United States. NRAO is one of three international partners responsible for building ALMA (<http://almaobservatory.org>) in the high northern Chilean desert. As such, NRAO is no stranger to the particular circumstances attendant on using cutting-edge technology in rural areas.
3. Moreover, NRAO is thoroughly committed to use of the Internet, whether to conduct its own affairs, to afford users of its facilities remote access and real-time remote observing, or to allow the general public access to the fruits of astronomical research. NRAO recognizes that equality of access to its activities, all publicly-supported, is contingent upon equal access to the Internet.

II. Comments on assessing use and utilization of spectrum

4. Recognizing that wireless will play an important role in disseminating access to the Internet, at ¶42-46 the Commission discusses “wireless service policies”, that is, by what regulatory means, and in which spectrum bands, broadband access might best be afforded. At 44 The Commission inquires; whether a census of the spectrum should be made; how such a census should be assessed; how “use” of spectrum should be measured; and how to identify “under-utilized” spectrum.
5. Most “uses” of spectrum involve marking the spectrum in some way by transmitting a signal: these are the so-called “active” uses. However, spectrum is also allocated to and employed for “passive” uses whereby the user just listens, eavesdropping on nature and the man-made environment, as it were. There are two major aspects of passive spectrum use:
 - a. Earth-sensing studies weather and climate, conditions on the surface and in the atmosphere, and is responsible for monitoring the current and likely future state of the planet and its inhabitants. Failure to support such studies could have apocalyptic consequences.
 - b. Astronomy studies conditions in the cosmos beyond the earth and is responsible for our understanding of man’s place in the Universe. Without such studies our worldview would not have progressed beyond the medieval.
6. Therefore, empty spectrum is not necessarily “unused” or “under-utilized”; it can be a vital, irreplaceable window upon nature and the Universe.

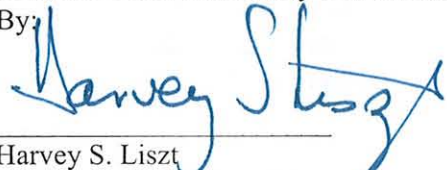
III. Assessment of spectrum utilization must account for passive use

7. Assessment of spectrum utilization must consider passive spectrum use. For NRAO and radio astronomy this implies considering the passive use of quiet spectrum and consideration of quiet and coordination zones around radio telescopes. The most prominent of these (<http://www.gb.nrao.edu/nrqz/nrqz.shtml>) is the National Radio Quiet Zone within which NRAO operates the Robert. C. Byrd Green Bank Telescope, but quiet and coordination zones also exist around other radio telescopes in particular spectrum bands and for particular purposes.

Respectfully submitted,

National Radio Astronomy Observatory

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28 May 2009

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